

Application No. 10/754,161  
Amendment dated April 19, 2006  
Reply to Office Action mailed January 20, 2006

### **AMENDMENTS TO THE CLAIMS**

*The listing of claims will replace all prior versions and listings of claims in the application:*

#### **Listing of Claims:**

1.     **(Original)**     An optical device alignment mounting stage, comprising:  
  
          a base;  
  
          an alignment carriage adjustably engaged with the base;  
  
          at least one rotation paddle attached to the alignment carriage; and  
  
          means for engaging the at least one rotation paddle to selectively rotate the alignment carriage.
  
2.     **(Original)**     An optical device alignment mounting stage as defined in claim 1, further comprising a component mount attached to the alignment carriage for supporting an optical component to be aligned.
  
3.     **(Original)**     An optical device alignment mounting stage as defined in claim 1, further comprising:  
  
          a means for engaging a pitch rotation paddle to selectively rotate the alignment carriage about a rotational pitch axis with respect to the base;  
  
          a means for engaging a roll rotation paddle to selectively rotate the alignment carriage about a rotational roll axis with respect to the base; and

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a means for engaging a yaw rotation paddle to selectively rotate the alignment carriage about a rotational yaw axis with respect to the base.

4. **(Original)** An optical device alignment mounting stage as defined in claim 3, wherein:

the means for engaging the pitch rotation paddle includes a pitch control screw that selectively engages the pitch rotation paddle;

the means for engaging the roll rotation paddle includes a roll control screw that selectively engages the roll rotation paddle; and

the means for engaging the yaw rotation paddle includes a yaw control screw that selectively engages the yaw rotation paddle.

5. **(Original)** An optical device alignment mounting stage as defined in claim 3, wherein at least one of the means for engaging the pitch rotation paddle, the means for engaging the roll rotation paddle, and the means for engaging the yaw rotation paddle includes a linear actuator that selectively engages the at least one rotation paddle.

6. **(Original)** An optical device alignment mounting stage as defined in claim 3, wherein each of the means for engaging is manually operated.

7. **(Original)** An optical device alignment mounting stage as defined in claim 1, wherein the portion of the alignment carriage that engages the base has a spherical shape.

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8. **(Original)** An optical device alignment mounting stage as defined in claim 1, wherein the alignment carriage engages the base via a plurality of contact points, the contact points being affixed to the base and being composed of a metallic material.

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9. **(Original)** An optical device alignment mounting stage, comprising:
- a base;
  - an alignment carriage adjustably engaged with the base;
  - at least one rotation paddle attached to the alignment carriage; and
  - at least one rotational control assembly that engages the at least one rotation paddle for selectively rotating the alignment carriage with respect to the base.
10. **(Original)** An optical device alignment mounting stage as defined in claim 9, further including three rotational control assemblies, wherein one rotational control assembly is included for each of three orthogonal pitch, roll, and yaw rotational axes.
11. **(Original)** An optical device alignment mounting stage as defined in claim 9, further comprising:
- a pitch rotational control assembly that selectively adjusts the alignment carriage about a rotational pitch axis;
  - a roll rotational control assembly that selectively adjusts the alignment carriage about a rotational roll axis; and
  - a yaw rotational control assembly that selectively adjusts the alignment carriage about a rotational yaw axis.
12. **(Original)** An optical device alignment mounting stage as defined in claim 11, wherein the pitch rotational control assembly and the yaw rotational control assembly engage a pitch/yaw rotation paddle for selectively adjusting the alignment carriage, and wherein the roll

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rotational control assembly engages a roll rotation paddle for selectively adjusting the alignment carriage.

13. (Original) An optical device alignment mounting stage as defined in claim 11, wherein a selected one of the rotational control assemblies can selectively adjust the alignment carriage in the corresponding rotational axis without causing movement of the alignment carriage in the other two rotational axes.

14. (Original) An optical device alignment mounting stage as defined in claim 9, further including a translation stage in operable communication with the base to enable translation of the alignment carriage in at least one of three orthogonal Cartesian coordinates.

15. (Original) An optical device alignment mounting stage as defined in claim 9, wherein at the at least one rotational control assembly is automatically controlled.

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16. **(Original)** An optical device alignment mounting stage, comprising:
- a base defining a partial cavity, the partial cavity including three contact points;
  - an alignment carriage adjustably positioned in the partial cavity of the base to movably engage the three contact points;
  - a first rotation paddle attached to the alignment carriage;
  - a second rotation paddle attached to the alignment carriage;
  - a pitch rotational control assembly including a threaded pitch control screw that selectively engages the first rotation paddle to adjust the alignment carriage about a rotational pitch axis;
  - a roll rotational control assembly including a threaded roll control screw that selectively engages the second rotation paddle to adjust the alignment carriage about a rotational roll axis; and
  - a yaw rotational control assembly including a threaded yaw control screw that selectively engages the first rotation paddle to adjust the alignment carriage about a rotational yaw axis; and
  - a component mount attached to the alignment carriage, the component mount being capable of adjustably securing an optical component.

17. **(Original)** An optical device alignment mounting stage as defined in claim 16, wherein the rotational pitch axis, the rotational roll axis, and the rotational yaw axis intersect to define a rotational center of the alignment carriage.

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18. **(Original)** An optical device alignment mounting stage as defined in claim 17, wherein the component mount is positioned on the alignment carriage such that the optical component is positioned at least proximate the rotational center.

19. **(Original)** An optical device alignment mounting stage as defined in claim 18, wherein:

- a longitudinal axis of the pitch control screw intersects the rotational roll axis;
- a longitudinal axis of the roll control screw intersects the rotational yaw axis; and
- a longitudinal axis of the yaw control screw intersects the rotational roll axis.

20. **(Original)** An optical device alignment mounting stage as defined in claim 19, wherein the physical dimensions of the first and second rotation paddles are configured to limit the range of motion of the alignment carriage.

21. **(Original)** An optical device alignment mounting stage as defined in claim 20, wherein the threaded control screws are manually operated.

22. **(New)** An optical device alignment mounting stage as defined in claim 1, wherein the alignment carriage includes a spherically-shaped surface configured to allow the alignment carriage to move about a rotational center.

23. **(New)** An optical device alignment mounting stage as defined in claim 1, further comprising a component mount.

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24. (New) An optical device alignment mounting stage as defined in claim 23, wherein the component mount is configured to mount the optical device at or near a rotational center of the alignment carriage.

25. (New) An optical device alignment mounting stage as defined in claim 24, wherein the rotational center is an intersection point of a roll axis, a yaw axis, and a pitch axis around which the alignment carriage is configured to rotate.

26. (New) An optical device alignment mounting stage as defined in claim 9, wherein the alignment carriage includes a quarter-sphere segment in contact with at least one contact point to allow the alignment carriage to rotate about a roll axis, a yaw axis, and a pitch axis.

27. (New) An optical device alignment mounting stage as defined in claim 9, further comprising a component mount configured to mount the optical device at or near a rotational center of the alignment carriage.

28. (New) An optical device alignment mounting stage as defined in claim 26, wherein the rotational center is an intersection point of a roll axis, a yaw axis, and a pitch axis around which the alignment carriage is configured to rotate.



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29. (New) A mounting stage, comprising:

a base including a plurality of contact points;

an alignment carriage having a spherically shaped surface defining rotational center, the spherically shaped surface being supported by the plurality of contact points such that the alignment carriage is configured to rotate about the rotational center; and

a component mount configured to mount a device at or near the rotational center of the alignment carriage.

30. (New) A mounting stage according to claim 29, further comprising:

at least one rotation paddle attached to the alignment carriage; and

means for engaging the at least one rotation paddle to selectively rotate the alignment carriage about a roll axis, a yaw axis, and a pitch axis.

31. (New) A mounting stage according to claim 30, wherein the roll axis, a yaw axis, and a pitch axis intersect at the rotational center.

32. (New) A mounting stage according to claim 29, wherein the component mount is configured to mount an optical device at or near the rotational center of the alignment carriage.

33. (New) A mounting stage according to claim 29, wherein the component mount is configured to mount a pigtail optical component.

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34. (New) A mounting stage according to claim 28, wherein the spherically shaped surface of the alignment stage defines a quarter-sphere segment.